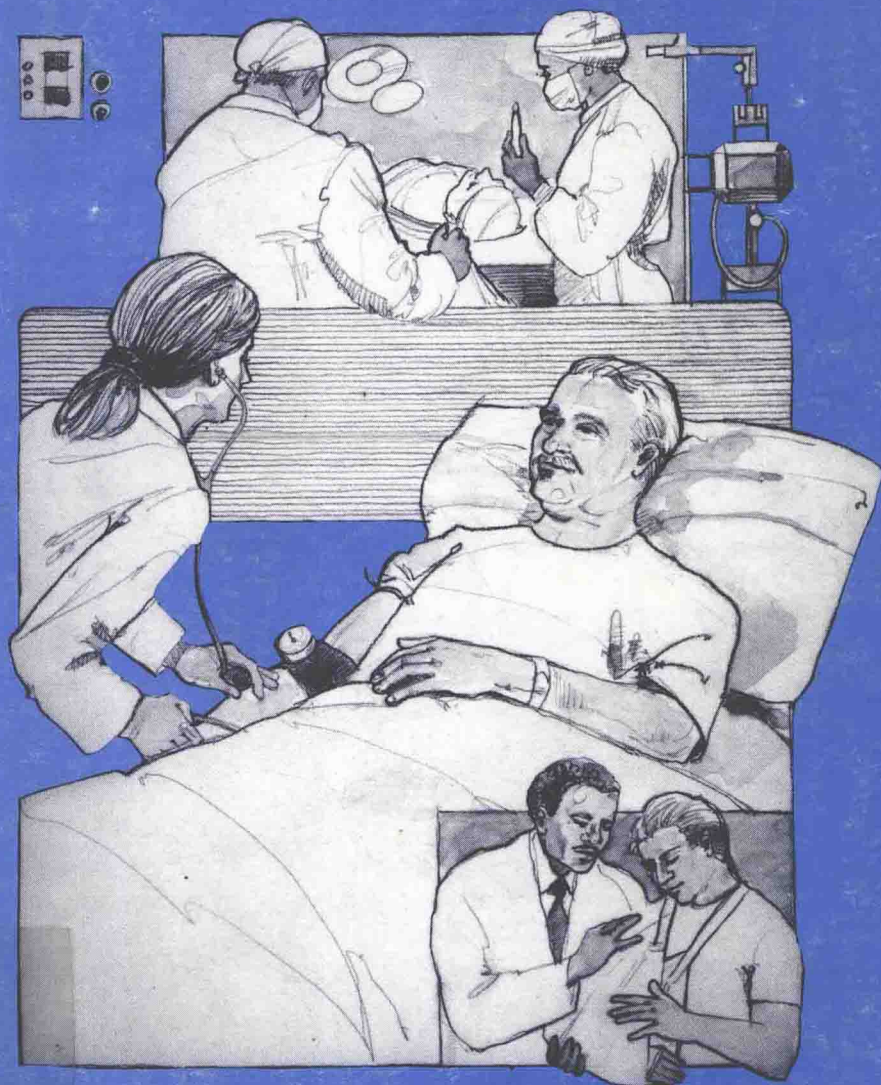


Acute Pain Management: Operative or Medical Procedures and Trauma



Acute Pain Management: Operative or Medical Procedures and Trauma

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The Agency for Health Care Policy and Research (AHCPR) was established in December 1989 under Public Law 101-239 (Omnibus Budget Reconciliation Act of 1989) to enhance the quality, appropriateness, and effectiveness of health care services and access to these services. AHCPR carries out its mission through conduct and support of general health services research, including medical effectiveness research, facilitating development of clinical practice guidelines, and dissemination of research findings and guidelines to health care providers, policymakers, and the public.

The legislation also established within AHCPR the Office of the Forum for Quality and Effectiveness in Health Care (the Forum). The Forum has primary responsibility for facilitating the development, periodic review, and updating of clinical practice guidelines. The guidelines will assist practitioners in the prevention, diagnosis, treatment, and management of clinical conditions.

Other components of AHCPR include: the Center for Medical Effectiveness Research, which has principal responsibility for patient outcomes research and studies of variations in clinical practice; the Center for General Health Services Extramural Research, which supports research on primary care, the cost and financing of health care, and access to care for underserved and rural populations; the Center for General Health Services Intramural Research, which uses large data sets for policy research on national health care expenditures and utilization, hospital studies, and long-term care; the Center for Research Dissemination and Liaison, which produces and disseminates findings from AHCPR-supported research, including guidelines, and conducts research on dissemination methods; the Office of Health Technology Assessment, which responds to requests from Federal health programs for assessment of health care technologies; and the Office of Science and Data Development, which develops specialized data bases and enhances techniques for using existing data bases for patient outcomes research.

Guidelines are available in formats suitable for health care practitioners, the scientific community, educators, and consumers. AHCPR invites comments and suggestions from users for consideration in development and updating of future guidelines. Please send written comments to Director, Office of the Forum, Executive Office Center, Suite 401, 2101 East Jefferson Street, Rockville, MD 20852.

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Availability of Guidelines

For each clinical practice guideline developed under the sponsorship of the Agency for Health Care Policy and Research (AHCPR), several versions are produced to meet different information needs.

The *Guideline Report* contains the clinical practice guideline with complete supporting materials, including background information, methodology, scientific evidence tables, and a comprehensive bibliography.

The *Clinical Practice Guideline* and the *Quick Reference Guide for Clinicians* (adult and pediatric versions for this guideline) are companion documents for use as desk-top references for clinical decisionmaking in day-to-day care of patients. Recommendations, algorithms or flow charts, tables and figures, and pertinent references are included.

A *Patient's Guide*, available in English and Spanish, is an informational booklet for the general public to increase consumer knowledge and involvement in health care decisionmaking.

Guideline information also will be available for on-line retrieval through the National Library of Medicine, the National Technical Information Service, and some computer-based information systems of professional associations, nonprofit organizations, and commercial enterprises.

To order guideline products or to obtain further information on their availability, call the AHCPR Clearinghouse toll-free at 800-358-9295, or write to: Center for Research Dissemination and Liaison, AHCPR Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907.

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Guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical conditions. This guideline was developed by an independent, multidisciplinary panel of private sector clinicians and other experts convened by the Agency for Health Care Policy and Research (AHCPR). The panel employed an explicit, science-based methodology and expert clinical judgment to develop specific statements on patient assessment and management for the clinical condition selected.

Extensive literature searches were conducted and critical reviews and syntheses were used to evaluate empirical evidence and significant outcomes. Peer review and field review were undertaken to evaluate the validity, reliability, and utility of the guideline in clinical practice. The panel's recommendations are primarily based on the published scientific literature. When the scientific literature was incomplete or inconsistent in a particular area, the recommendations reflect the professional judgment of panel members and consultants. In some instances, there was not unanimity of opinion.

The guideline reflects the state of knowledge, current at the time of publication, on effective and appropriate care. Given the inevitable changes in the state of scientific information and technology, periodic review, updating, and revision will be done.

We believe that the AHCPR-assisted clinical guideline development process will make positive contributions to the quality of care in the United States. We encourage practitioners and patients to use the information provided in this clinical practice guideline. The recommendations may not be appropriate for use in all circumstances. Decisions to adopt any particular recommendation must be made by the practitioner in light of available resources and circumstances presented by individual patients.

J. Jarrett Clinton, M.D.

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Foreword

Approximately 23.3 million operations were performed in 1989 in the United States, and most of these involved some form of pain management. Unfortunately, clinical surveys continue to indicate that routine orders for intramuscular injections of opioid “as needed”—the standard practice in many clinical settings—fail to relieve pain in about half of postoperative patients. Postoperative pain contributes to patient discomfort, longer recovery periods, and greater use of scarce health care resources and may compromise patient outcomes.

There is wide variation in the methods used to manage postoperative and other acute pain, ranging from no set strategy to a comprehensive team approach as advocated in this clinical practice guideline. This guideline sets forth procedures to minimize the incidence and severity of acute pain after surgical and medical procedures and pain associated with trauma in adults and children. It offers clinicians a coherent yet flexible approach to pain assessment and management for use in daily practice.

Although it is not practical or desirable to eliminate all postoperative and other acute pain, an aggressive approach to pain assessment and management can reduce such pain, increase patient comfort and satisfaction, and in some cases, contribute to improved patient outcomes and shorter hospital stays.

This clinical practice guideline was developed under the sponsorship of the Agency for Health Care Policy and Research (AHCPR), Public Health Service, U.S. Department of Health and Human Services. To develop the guideline, AHCPR convened an interdisciplinary expert panel made up of physicians, nurses, a pharmacist, a psychologist, a physical therapist, a patient/consumer, and an ethicist. The panel first undertook an extensive and interdisciplinary clinical review of current needs, therapeutic practices and principles, and emerging technologies for pain assessment and management. Second, the panel conducted a comprehensive review of the field to define the existing knowledge base and critically evaluate the assumptions and common wisdom in the field. Third, the panel initiated peer review of guideline drafts and field review with intended users in clinical sites. Comments from these reviews were assessed and used in developing the guideline.

This is the first edition of the *Clinical Practice Guideline for Acute Pain Management: Operative or Medical Procedures and Trauma*. Further editions will be produced as needed to reflect new research findings and experience with emerging technologies for pain assessment and relief.

Abstract

Approximately 23.3 million operations were performed in 1989 in the United States, and most of these involved some form of pain management. Unfortunately, standard pain relief techniques fail to relieve pain in about half of postoperative patients. This guideline offers clinicians a coherent yet flexible approach to assess and manage pain in daily practice. It emphasizes a collaborative, interdisciplinary approach to pain control, including input from the patient; aggressive use of both drug and non-drug therapies; assessment and frequent reassessment of the patient's pain; and a formal, institutional approach to pain management. The guideline includes strategies for overall and site-specific pain control; addresses issues related to special groups such as children and the elderly; and contains analgesic dosage tables for adults and children, sample pain assessment tools, examples of non-drug interventions, and pre- and postoperative pain management flow charts. This scientifically based guideline was developed under the sponsorship of the Agency for Health Care Policy and Research (AHCPR), Public Health Service, U.S. Department of Health and Human Services, by a private-sector, expert panel.

Acknowledgments. The Acute Pain Management Guideline Panel expresses profound appreciation to the patients who helped us in the development of the consumer version of the guideline and to our numerous colleagues in many disciplines who made valuable contributions during the development of the guideline. We are especially grateful to Dr. Mitchell Max of the American Pain Society for his continuous and enthusiastic support and advice. Dr. Ada Jacox thanks her colleagues at The Johns Hopkins University for their thoughtful contributions and encouragement.

Numerous colleagues in the Departments of Surgery, Anesthesia, and Nursing at Massachusetts General Hospital provided informal yet valuable input as portions of the guideline were being written at that site. Dr. Daniel Carr's clinical colleagues in the Division of Pain Management of the Department of Anesthesia willingly increased their clinical load when the guideline development process became particularly time consuming. This extra workload fell particularly upon the shoulders of the Postoperative Pain Service, directed by Dr. Bucknam McPeck, and the Diagnostic and Therapeutic Nerve Blocking Unit, directed by Dr. Donald P. Todd. Dr. Richard J. Kitz, the Henry Isaiah Dorr Professor and Chairman of Anesthesiology, and Dr. George E. Battit, Vice-Chairman, provided constant encouragement for this project and facilitated it in many practical ways. Miss Evelyn Hall provided expert and dedicated administrative and secretarial assistance.

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Acute Pain Management: Operative or Medical Procedures and Trauma

Executive Summary

Clinical surveys continue to indicate that routine orders for intramuscular injections of opioid “as needed” fail to relieve pain in about half of postoperative patients. Recognition of the widespread inadequacy of pain management has prompted recent corrective efforts within multiple health care disciplines, including surgery, anesthesiology, and nursing, as well as pain management groups.

This *Clinical Practice Guideline for Acute Pain Management: Operative or Medical Procedures and Trauma* was commissioned by the Agency for Health Care Policy and Research (AHCPR). The guideline is designed to help clinicians, patients, and patients’ families to understand the assessment and treatment of postoperative and other acute pain in both adults and children.

To develop the guideline, AHCPR convened an interdisciplinary panel of physicians, nurses, a pharmacist, a psychologist, a physical therapist, a patient/consumer, and an ethicist. The guideline development process included an extensive review of current needs, therapeutic practices and principles, and emerging technologies for postoperative pain control. All pertinent guidelines and standards were reviewed, opinions were obtained from external consultants, and testimony was received at an open forum held on November 20, 1990 in Washington, DC. An exhaustive literature search was conducted to define the knowledge base and critically evaluate the assumptions and common wisdom of the field. Although the review focused primarily on postoperative pain, literature on procedure-related and trauma pain was also considered. Drafts of the guideline were peer-reviewed and then tested in the field by intended users in various clinical sites.

The guideline has four major goals:

1. Reduce the incidence and severity of patients’ acute postoperative or posttraumatic pain.
2. Educate patients about the need to communicate unrelieved pain so they can receive prompt evaluation and effective treatment.
3. Enhance patient comfort and satisfaction.
4. Contribute to fewer postoperative complications and, in some cases, shorter stays after surgical procedures.

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Not all acute postoperative, procedural, or trauma-related pain can be eliminated, but several alternative approaches, when appropriately and attentively applied, prevent or relieve pain. The importance of effective pain management increases beyond patient satisfaction when additional benefits for the patient are realized, e.g., earlier mobilization, shortened hospital stay, and reduced costs.

This guideline addresses the care of patients with acute pain associated with operations, medical procedures, or trauma. All age groups are covered, from neonates to the elderly. It outlines the physiological basis of pain and summarizes clinical studies linking effective postoperative pain management with improved patient outcomes.

Because patients vary greatly in medical conditions and operations, responses to pain and interventions, and personal preferences, the guideline offers a flexible approach to management of acute pain that clinicians can adapt and use in daily practice.

The guideline emphasizes:

- A collaborative, interdisciplinary approach to pain control, including all members of the health care team and input from the patient and the patient's family, when appropriate;
- An individualized proactive pain control plan developed preoperatively by patients and practitioners (since pain is easier to prevent than to bring under control, once it has begun);
- Assessment and frequent reassessment of the patient's pain;
- Use of both drug and nondrug therapies to control and/or prevent pain;
- A formal, institutional approach to management of acute pain, with clear lines of responsibility.

The guideline includes strategies for overall pain control as well as site-specific pain control and addresses issues related to special groups such as children and the elderly. Additionally, it contains analgesic dosage tables for adults and children, sample pain assessment tools, examples of nondrug interventions, and pre- and postoperative pain management flow charts.

Guideline development is a dynamic process, and new therapies and technologies are always emerging. This is the first edition of the *Clinical Practice Guideline for Acute Pain Management*. Further editions will be prepared to reflect new research findings and experience with emerging technologies for pain assessment and relief.

Acute Pain Management: Operative or Medical Procedures and Trauma

Introduction

This guideline addresses the care of patients with acute pain after operation, medical procedures, or trauma. (Methods used to develop the guideline are in appendix A.) It outlines the physiological basis for pain and cites clinical studies linking effective postoperative pain management with improved patient outcomes. The guideline also describes practices that can minimize or eliminate acute pain. Rigid prescriptions for postoperative pain control are inappropriate because patients vary greatly in the severity of their preexisting pain, medical conditions, and pain experiences; the extensiveness of pathology and associated operations; responses to interventions; personal preferences; and the settings in which they receive care. Instead, this guideline offers clinicians a coherent yet flexible approach to pain assessment and management in daily practice. This guideline has four major goals:

1. Reduce the incidence and severity of patients' postoperative or posttraumatic pain.
2. Educate patients about the need to communicate unrelieved pain so they can receive prompt evaluation and effective treatment.
3. Enhance patient comfort and satisfaction.
4. Contribute to fewer postoperative complications and, in some cases, shorter stays after surgical procedures.

Need for Aggressive Postoperative Pain Control _____

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage (International Association for the Study of Pain, 1979; Merskey, 1964). No matter how successful or how deftly conducted, operations produce tissue trauma and release potent mediators of inflammation and pain (Hargreaves and Dionne, 1991).

Pain is just one response to the trauma of surgery, however. In addition to the major stress of surgical trauma and pain, the substances released from injured tissue evoke "stress hormone" responses in the patient. Such responses promote breakdown of body tissue; increase metabolic rate, blood clotting, and water retention; impair immune function; and trigger a "fight or flight" alarm reaction with autonomic features (e.g., rapid pulse) and negative emotions (Dinarello, 1984; Egdahl, 1959; Kehlet, 1982; Kehlet, Brandt, and Rem, 1980). Pain itself may lead

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to shallow breathing and cough suppression in an attempt to “splint” the injured site, followed by retained pulmonary secretions and pneumonia (Anscombe and Buxton, 1958; Hewlett and Branthwaite, 1975; Latimer, Dickman, Day, Gunn, and Schmidt, 1971; Marshall and Wyche, 1972; Sydow, 1989). Unrelieved pain also may delay the return of normal gastric and bowel function in the postoperative patient (Wattwil, 1989).

The physiological and psychosocial risks associated with untreated pain are greatest in frail patients with other illnesses such as heart or lung disease, those undergoing major surgical procedures such as aortic surgery, and the very young or very old. Because of advances in surgical and anesthetic techniques, it is now common for such patients to undergo operations once dismissed as prohibitively risky.

Approximately 23.3 million operations were performed in the United States in 1989 (Peebles and Schneidman, 1991), and most of these involved some form of pain management. Unfortunately, clinical surveys continue to show that routine orders for intramuscular injections of opioid “as needed” will leave more than half of postoperative patients with unrelieved pain due to undermedication (Marks and Sachar, 1973; Donovan, Dillon, and McGuire, 1987; Oden, 1989; Sriwatanakul, Weis, Alloza, Kelvie, Weintraub, and Lasagna, 1983). In the past, postoperative pain was thought to be inevitable, a harmless though intense discomfort that the patient had to tolerate. Unrelieved pain after surgery or trauma is often unhealthy; fortunately, it is preventable or controllable in an overwhelming majority of cases. Patients have a right to treatment that includes prevention or adequate relief of pain.

Recognition of the widespread inadequacy of pain management has prompted recent corrective efforts within multiple health care disciplines, including surgery (Kehlet, 1989a; Royal College of Surgeons, 1990), anesthesiology (Phillips and Cousins, 1986; Ready, Oden, Chadwick, Bendetti, Rooke, Caplan, and Wild, 1988); nursing (Jacox, 1977; American Nurses Association, 1991), and pain management groups (National Health and Medical Research Council of Australia, 1988; American Pain Society, 1989; International Association for the Study of Pain, 1991). Although it is not practical or desirable to eliminate all postoperative pain, this clinical practice guideline sets forth procedures to minimize the incidence and severity of acute pain after surgical or medical procedures and trauma. The guideline is designed to help clinicians, patients, and patients’ families understand the assessment and treatment of postoperative and other acute pain in both adults and children.

Health care is both a technical and an ethical enterprise. The ethical obligation to manage pain and relieve the patient’s suffering is at the core of a health care professional’s commitment. While medical treatments often involve risks and burdens, anything harmful to the patient, including postoperative pain, should be

minimized or prevented if possible. The ethical importance of pain management is further increased when additional benefits for the patient are realized—earlier mobilization, shortened hospital stay, and reduced costs. If inadequate pain management results from a clinician's conflict between reducing pain and avoiding potential side effects and/or legal liability, achieving greater technical competence and knowledge of risks and benefits can help to reduce such conflicts.

Prevention is Better than Treatment _____

Pain is dynamic. Without treatment, sensory input from injured tissue reaches spinal cord neurons and causes subsequent responses to be enhanced. Pain receptors in the periphery also become more sensitive after injury. Recent studies demonstrate long-lasting changes in cells within spinal cord pain pathways after a brief painful stimulus (Bullitt, 1989; Fitzgerald, 1990; Hanley, 1988; Hunt, Pini, and Evan, 1987; Przewlocki, Haarmann, Nikolarakis, Herz, and Holtt, 1988). Such physiological studies confirm longstanding clinical impressions that established pain is more difficult to suppress (McQuay, 1989; Wall, 1988; Woolf and Wall, 1986). The health care team should encourage patients to request pain medication before the pain becomes severe and difficult to control. Furthermore, the team should teach patients simple relaxation exercises to help decrease postoperative pain (Ceccio, 1984).

Aggressive pain prevention and control that occurs before, during, and after surgery can yield both short- and long-term benefits. In the very short term, for example, a patient's first request for analgesia after orthopedic surgery occurs later after operations performed with opioid premedication and intraoperative nerve blocks than after general anesthesia alone (McQuay, Carroll, and Moore, 1988). In the short term, patients who undergo cesarean section under epidural anesthesia request less postoperative pain medication in the next 3 days than patients who have general anesthesia (Hanson, Hanson, and Matousek, 1984). Also in the short term, postoperative patients able to self-medicate with small intravenous doses of opioids such as morphine metered out by a programmable infusion pump—patient controlled analgesia or PCA (Ferrante, Ostheimer, and Covino, 1990)—have less pain and are more satisfied with their pain relief. These patients tend to be discharged earlier from the hospital compared with those given the same drug on an "as-needed" basis (Guideline Report, in press; Bollish, Collins, Kirking, and Bartlett, 1985; Eisenach, Grice, and Dewan, 1988; Jackson, 1989; Wasylak, Abbott, English, and Jeans, 1990).

In the long term, after elective limb amputation for vascular insufficiency, patients who receive epidural analgesia before an operation are less likely to have chronic phantom limb pain, in contrast to those conventionally treated (Bach, Noreng, and Tjellden, 1988). Pilot studies such as these that show diverse benefits